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OBSERVATIONS

NAVY ESTIMATES

1903-4

REVISED EDITION

BY

LORD BRASSEY, K.C.B., D.C.L.

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SPOTTISWOODE & CO. LTD., NEW-STREET SQUARE, LONDON

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OBSERVATIONS
ON
NAVY ESTIMATES
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LORD BRASSEY, K.C.B., D.C.L.

‘For my own part, I am deeply convinced that all excess in the public expenditure, beyond the legitimate wants of the country, is not only a pecuniary waste—for that, although an important, is yet a comparatively trifling matter—but a great political and, above all, a great moral evil. It is a characteristic, Sir, of the mischiefs which arise from financial prodigality that they creep onwards with a noiseless step; that they commonly remain unseen and unfelt until they have reached a magnitude absolutely overwhelming.’—GLADSTONE (1862)

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OBSERVATIONS

ON

NAVY ESTIMATES, 1903-4.

THE British Navy Estimates for 1903-4 amount to 34,457,000*l.*, as against 31,225,000*l.* for the previous year. Heavy increases of expenditure for warlike preparations are a strange sequel to the conclusion of peace. The policy on which we have entered is not the policy on which the great statesmen of the past—Lord Beaconsfield not less earnestly than Mr. Gladstone—insisted. During the Russo-Turkish war Navy Estimates had been considerably increased. At the close of the war our expenditure was cut down to the greatly reduced figures which Lord Northbrook's Board inherited from their predecessors. Lord Beaconsfield's method of dealing with the Navy seems wiser to-day than it appeared to those at the Admiralty a quarter of a century ago, when an increase of the Navy was needed and funds were scanty.

Our present expenditure is increasing beyond all precedent. The severe and costly struggle in South Africa has been brought at last to a successful issue. No enemy threatens. For all the Powers costly armaments are becoming an intolerable burden. Is our proposed expenditure necessary? Can our

present charges be borne without detriment to the national progress and prosperity ?

Necessity
for
economy.

In his speech at Bristol in September last, Sir Michael Hicks-Beach expressed the opinion that a continued increase of expenditure, even for the Navy, was impossible. Our Navy Estimates had gone up in seven years from 18,700,000*l.* to 32,500,000*l.*

In the eloquent address with which he opened the Colonial Conference, Mr. Chamberlain spoke in grave and anxious terms of our burdensome expenditure—‘The weary Titan groans beneath the orb of his too vast fate.’ The leading witnesses with Treasury experience who appeared before the Committee on National Expenditure, Sir George Murray and Lord Welby, expressed regret that Parliament criticised less closely than formerly. Its tendency was to urge the Executive Government to increased expenditure instead of the reverse.

The present Chancellor of the Exchequer has not thought it necessary to insist that the growth of naval expenditure should be checked. In a recent speech he said : ‘The most careful watch ought to be kept over the expenditure for the Navy. The money ought to be economically administered ; but, taking it for granted that it is economically administered, I am quite sure that the country is ready to bear any expenditure that may be entailed upon it by maintaining the efficiency of the Navy.’ Recent elections suggest some doubt as to whether these assurances rest on full knowledge of what is passing in the popular mind.

Thus far the burdens thrown upon the taxpayers have fallen lightly, except on the class which has to bear heavy charges for succession duty. Their condition is often pitiful.

British statesmen, and political parties of all shades, are agreed that our sea-power must be adequately sustained. They have studied the writings of Captain Mahan. His luminous narrative has shown convincingly the influence of sea-power on the course of history. The Memorandum which the Admiralty laid before the Colonial Conference was a masterly summary of the teachings of history from the earliest times. It showed how supremacy at sea has given control over communication, and has always made it impossible in war for the weaker Power to send a military expedition across the seas. We depend on the Navy for the protection of our commerce. These considerations enforce the necessity for efficiency. It may be promoted by economy, especially in services of merely local importance, which exercise no direct influence in winning command of the sea. By wisely husbanding resources in peace, we may be possessed of more elastic resources in the contingency—which may Heaven avert—of a great naval war.

In framing estimates for the British Navy we have chiefly to look to the policy of other Powers. We do not regard the United States as a possible foe. No other Power—no combination of Powers—could vie with the people of the United States, if it were their

United
States.

policy to employ their unrivalled and rapidly growing resources in the creation of a predominant Navy. Their position is impregnable. They are self-contained, and their situation does not compel them to divert expenditure to the defence of land frontiers. In her political relations with the United States, England may confidently reckon that the claims of kinship will always prevail. Blood is thicker than water. Great Britain and the United States are bound to one another as no other nations are, by religion, race, language, and material interests. On many issues the two countries can work together and exert a commanding influence. Captain Mahan has said truly, ‘In the control of the sea, the beneficent instrument that separates us that we may be better friends, will be found the object that neither the one nor the other can master, but which may not be beyond the conjoined energies of the race.’

Com-
parison of
estimates.

Our rivals—not necessarily unfriendly rivals—are nearer at hand. Sir John Colomb’s return shows the expenditure for the British Navy as approximately equal to that of France, Russia, and Germany. The figures are as under :—

BRITISH EMPIRE.

	£
Navy Estimates, 1903-4	34,457,000
Expenditure under Naval Works Act, say	3,000,000
India (return of last session)	462,000
Australian Commonwealth	172,000
New Zealand	22,000
Cape of Good Hope	30,000
	38,143,000

The expenditure of other Powers for the year 1903 is as under :—

	£
Russia ¹	10,877,000
Germany	10,887,000
France	12,524,000
Total	<u>34,288,000</u>

¹ The amount is probably larger owing to extraordinary expenditure.

Navy Estimates have grown rapidly in Russia and Germany. In France they have been stationary. Further increases may not be approved in France or Germany. M. Pelletan's defence of his policy in the Chamber was based entirely upon the arguments of the *jeune école*. It is useless, he said, to fight where the contest is a matter of millions. France has not such a long purse as her rivals, and, even if she could equal Great Britain, how could she enter the field if Germany and the United States were engaged in the conflict? He, therefore, dissents entirely from the advocates of the *grande guerre*.

We have seen that our aggregate expenditure exceeds that of the leading continental Powers combined, and we build more cheaply than is possible in France and Russia. The British *Majestic*, 14,900 tons, cost, according to the Dockyard Expenses Account, 395,504*l.*; the *Charlemagne*, 11,108 tons, 1,096,432*l.* The cost for the British battleship with her armament is 39 per cent. less per ton than for the *Charlemagne*. If we take the latest ships designed by Sir William White, the revised estimate

Cost of
con-
struction,
England
and
France.

for the *London*, of 15,000 tons, is 1,107,111*l.*, as against 1,431,013*l.* for *La République* and 1,602,048*l.* for *La Patrie*, battleships of 14,030 tons recently laid down for the French Navy. The comparative cost in England and France has been minutely examined by the French shipbuilding officers. The committee of the French Chamber on the Navy Estimates for 1900 gave the result of their inquiries, with examples. The general results of an exhaustive comparison showed the cost per ton—labour only—for the English Navy, 15*l.* 18*s.* 0*d.* ; for the French, 22*l.* 3*s.* 0*d.* Materials, armour, hull, and fittings, English ships, 22*l.* 4*s.* 0*d.* per ton ; French ships, 37*l.* 2*s.* 0*d.* The British Admiralty has an advantage in the active competition of contractors. The number on the Admiralty list is such that combination to keep up prices, as in France, is impossible.

Ship-
building
votes.

While the votes for manning show a large excess, in shipbuilding we have barely kept pace with the leading Powers. The expenditure for the five years 1898–1902, as given in the German Naval Annual, *Nauticus*, compares as under :—

	Total Navy Estimates	Shipbuilding, including armaments
	£	£
England	151,420,000	66,335,000
France	62,490,000	29,060,000
Russia	47,755,000	18,755,000
Germany	40,515,000	19,055,000
	150,760,000	66,870,000

Comparing the figures for 1898-1902, the total expenditure and the appropriation to shipbuilding were as under :—

	1902		1898	
	Total Navy Estimates	New construction and armaments	Total Navy Estimates	New construction and armaments
	£	£	£	£
England . . .	33,025,000	14,610,000	25,625,000	10,415,000
France . . .	12,640,000	6,115,000	11,620,000	5,530,000
Russia . . .	10,815,000	4,060,000	7,485,000	3,005,000
Germany . . .	10,250,000	5,150,000	6,105,000	2,565,000
	33,705,000	15,325,000	25,210,000	11,100,000
United States . .	16,100,000	7,235,000	11,785,000	4,450,000

For 1903-4 the shipbuilding votes for the British Navy provide for a total expenditure on new construction of 10,137,000*l.*, of which 1,150,000*l.* will be devoted to the commencement of new ships. The increase of nearly 1,100,000*l.* over 1902-3 brings us approximately to a level with the aggregate expenditure on shipbuilding, as proposed in the budgets of France, Russia, and Germany for 1902. We are bound to keep pace with rival Powers. When we see a pause elsewhere, as now in France, we stand ready to cut down.

Resources have been unprofitably applied in the building of ships which, though as costly ton per ton as the most powerful types, have been put aside as obsolete almost as soon as they were completed.

Types of ships.
Battle-ships.

They were too small to hold the sea, and too slow to give protection to trade. They carried a large spread of sail. In coal endurance, armour, and armament they were defective. The newest designs offer little scope for criticism. In the battleships of the British Navy we have for many years past seen a steady improvement in speed, armament, and protection. The increased resisting power of armour has made it possible to reduce the thickness and so to cover a larger area of side. In increase of dimensions, England has led the way. Our latest displacements fall little short of 17,000 tons. The United States *Louisiana* and *Connecticut* are approximately of the same tonnage. Increase of dimensions has been reluctantly accepted in the French Navy. Three ships have now been laid down, and three are proposed, having a displacement of 14,630 tons. The largest vessels building for Russia have a displacement of 13,516 tons. For Germany the largest ship in construction has a displacement of 12,792 tons. The French battleships, though inferior in displacement, are as costly as the British.

In battleships of even date it is safe to assume that the relative fighting efficiency may be measured by the displacement. There can be no more competent authority on this subject than Sir William White. In an article contributed to *Cassier's Magazine* he wrote as follows :—

‘ If the conditions of the problem were stated in identical terms to the leading warship designers of the

world, the results obtained would not differ greatly as regards the sizes of ships proposed to fulfil the conditions. Differences in proportions and forms there would be, no doubt. But the differences that exist in dimensions of existing warships, in comparable classes, must be chiefly assigned to differences in the conditions laid down to govern the designs. Any improvement which may be originated in one country in materials of construction, marine engineering, gunnery, torpedoes, explosives or armour, does not, and from the nature of the case cannot, long remain solely in the hands of its originators. There is no monopoly of invention or technical skill. What has been accomplished in one country will speedily be rivalled, or perhaps temporarily excelled elsewhere.'

In the cruiser class we have advanced to the dimensions of battleships. The *Drake* class have a displacement of 14,100 tons; the *Tennessee* and the *Washington* a displacement of 14,560 tons. The French cruisers of the *Gambetta* type have a displacement of 12,351 tons. In Russia, the large cruiser, formerly a conspicuous feature, has disappeared from the shipbuilding programme. The cruisers building for Germany are few and of the third class. In Russia and Germany efforts are concentrated on battleships. Cruisers.

Careful consideration should be given to the distribution of expenditure on shipbuilding, as between battleships and cruisers. At the commencement of the year the tonnage in construction for the British and other Navies compared as under :—

Distribu-
tion of
ship-
building
expendi-
ture.

	Battleships		Large Cruisers	
	Numbers	Displacement	Numbers	Displacement
		Tons		Tons
Great Britain	10	156,000	22	221,800
France	6	89,200	8	92,800
Russia	6	87,900	3	20,000
Germany	6	76,400	3	27,600

Since the building of the *Powerful* and *Terrible*, British cruisers show an improvement of design surpassed in no other Navy. In the *Duke of Edinburgh*, the new type designed by Mr. Watts, the protection of a second-class and the armament of a first-class battleship are combined with the speed of a cruiser. We may be well content if the promise of over 22 knots is fulfilled at sea. Higher speeds can only be obtained by the sacrifice of fighting efficiency. For extreme speeds we should look to our mercantile auxiliaries. It is not a wise appropriation of naval votes to build ships for the Navy in which every consideration is sacrificed to speed.

In cruisers of the first-class with speeds of 22 knots Great Britain has a substantial advantage. Completed or rapidly advancing to completion, we have ten ships of the *Monmouth* type, 9,800 tons; six *Cressy*, 12,000 tons; four *Good Hope*, 14,100 tons; six of the *Devonshire* class, 10,700 tons, now building. In 1903-4 it is proposed to commence four first-class armoured cruisers of the *Duke of Edinburgh* type, or six in all of this class. Of the seventeen French ships of even speed, one is completed, six are going through

their trials, and three are not yet launched. Critics of naval administration in France complain that their Navy is inferior in the number, the power, and the speed of its cruisers, and that money has been wasted in building vessels too small to be effective.

COMPARATIVE STRENGTH.

Having given the expenditure, let us compare the naval forces of the Powers.

In ability to man our ships with permanent men we have nothing to fear from any comparison. The *personnel* of the great fleets is given in the *Taschenbuch der Kriegsflootten* for 1902 as under: Great Britain 122,900, France 53,000, Russia 62,000, Germany 33,500, United States 37,800, Japan 31,000. While the latest figures in Part IV. of the *Naval Annual* differ from the above, they bring out the greater reliance placed by the continental Powers on reserves as compared with Great Britain. In the case of Russia no inconsiderable proportion of men are recruited from the inland provinces of the empire. They pass the winter months ashore in the ice-bound island of Cronstadt. Their summer experiences are confined to the land-locked and generally unruffled waters of the Gulf of Finland. Landsmen in large numbers are found in the naval forces of France, Germany, and the United States. This policy of training men for a few years, and then passing them into the Reserve, is one deliberately adopted by all

Per-
manent
force.

the Powers except Great Britain. It is based on a consideration of the numerous unskilled duties which have to be performed on board ship. Beyond a safe provision for the replacement of casualties, the experience of war is not different from industrial undertakings. It is a waste of resources to train up skilled men for the performance of unskilled duties.

Revision
of com-
plements.

When large reductions of crews in the winter months were lately proposed by the French Minister of Marine, it was urged by writers in Service journals as an alternative policy that the complements should be permanently retained, but with reduced numbers. The suggestion merits the serious consideration of the British Admiralty. The full numbers for ammunition parties, and for manning every gun in secondary armaments, can hardly be indispensable in peace service. Complements could be promptly raised to a war footing from the Reserves. Some revision of numbers would help us to provide crews for new ships without increasing the permanent force.

Ships in
com-
mission.

Our strength in ships in commission in European waters shows a decided superiority over any conceivable combination. France is the leading maritime Power of the continent, and the main strength of her Navy is concentrated in the Mediterranean. In European waters Great Britain has the Mediterranean, the Channel, the Home, the Reserve Fleets, and a cruiser squadron, already powerful, and in process of being rapidly reinforced. Near home our

superiority is indisputable. In China our squadron is approximately equal to that of Russia in battleships and large cruisers, and the treaty recently negotiated with Japan secures the support of a powerful ally in case of need, with a fleet of six first-class battleships and six first-class cruisers.

Dealing with the fleet in commission, Lord Selborne, in his Memorandum on the Estimates for the present financial year, writes as follows : ‘ I trust that, as the result of the work of the Reserve Committee, a principle and standard in respect of the manning of the Navy will be adopted by the Board which will receive the seal of the concurrence of Parliament ; but, in view of the constant demands that are made in various quarters that additional ships should be placed in commission, I wish to lay stress on the fact that the number of the active service ratings must continue to increase disproportionately to the growth of the Reserves, unless a fairly constant ratio is observed between the ships in commission and the ships in reserve.’

In view of these remarks of Lord Selborne, the policy to be adopted in relation to the numbers and the distribution of ships in commission demands earnest attention from Parliament. The principles to be followed in order to make the most effective use of our sea-power were ably expounded by the Admiralty in the Memorandum submitted to the members of the Colonial Conference of last year. Concentration on the decisive points is essential. The naval force

The need
of con-
centrated
forces.

of France is concentrated in the Mediterranean, that of Germany in Northern waters, that of Russia in the Far East. These dispositions determine those made by the British Admiralty.

The wide extent of the British Empire, and the necessity of giving protection to commerce of immeasurable value, extending to every sea, impose on the Admiralty a responsibility such as falls to no other administration, and justify naval expenditure largely exceeding that of the other maritime Powers of Europe. Confidence in the patriotic resolve of Parliament to deal in no niggardly spirit with naval requirements should not, however, discourage those concerned in naval administration, whether from within or from without, in the effort to cut down expenditure where it is least necessary. To maintain naval forces, consisting of vessels useful only for peace services, in waters where we have no rivals is a waste of money. It is due to the Admiralty to recognise that the policy of concentration in home and European waters has been begun. Two dépôt ships have been sold. One second-class cruiser from the Cape station, and a sloop from the south-east coast of America, have been withdrawn without relief. Two gunboats have been withdrawn from the Zambesi.

The reduction of non-effectives in commission—our *poussière navale*—should be carried further. The general position is shown in the tables prepared for Chapter III. of the *Naval Annual* of this year.

The complements of our ships in commission in the

Atlantic may be taken at from 6,000 to 7,000 men. The return laid by the Admiralty before the Colonial Conference gives the cost of maintenance, exclusive of building, as under :—

North America and West Indies . . .	£330,000
Cape of Good Hope . . .	396,000
South-East Coast of America . . .	76,000
	£802,000

With the powerful Cruiser Squadron and the Channel Fleet ready for any service a reduction should be possible. The continental Powers make no imposing display of naval force in the Atlantic.

On the Pacific station the British Squadron The
Pacific. includes one first-class, two second-class cruisers, and a sloop, manned approximately by 1,400 men. No other European flag is permanently shown in those distant waters.

The complements on the Australian station number some 3,500. Our Australian Squadron, reconstituted as recommended by Admiral Beaumont, should include one first-class cruiser (already on the station), and two or three modern second-class cruisers, which could be provided from the China station. The police work for the islands requires separate consideration. For political reasons it is desirable to keep up an effective squadron for Australasia. It is a link with the Mother-country and a reserve for the China Squadron. It will be valuable for recruiting and training the Colonial Naval Reserve.

The French naval force in the Pacific consists of one second-class cruiser, complement 375, as against the combined strength of our Pacific and Australian Squadrons.

China.

In the China Seas our complements number some 8,000 men. Official returns give the cost of maintaining the squadron at 1,430,000*l.* A reduction should be possible by the gradual withdrawal of small vessels.

East
Indies.

The Imperial naval force on the East India station consists of seven ships manned by 1,369 men. The Indian Government should be encouraged to strengthen the local Navy. The cost of maintenance of the squadron is 303,000*l.*

The flags of the leading maritime Powers of continental Europe are rarely seen on the stations with which we have been dealing. There are no organised squadrons. The total number in the British ships aggregate some 13,000 men. Many vessels might be withdrawn without prejudice to our interests. Their crews would be available for manning of the powerful battleships and cruisers now in hand.

Persian
Gulf.

In view of recent incidents and debates a brief digression may here be made. Proposals for a Russian naval establishment in the Persian Gulf have been in the air. It has been stated, on behalf of the Government, that we claim an exclusive control in the Persian Gulf. It is a claim difficult to justify, and not resting as it would seem on a definite appreciation of what is necessary for the defence of India.

Many long years must elapse ere Russia can form

a naval base in the Persian Gulf, strongly fortified, adequately equipped with docks, workshops and stores, and the large body of skilled workmen required in a naval yard. Meanwhile we should not be idle. A suitable flotilla would gradually be formed, probably at Kurrachee. It would cost us little to put into a local steam reserve such vessels as the *Colossus*, *Edinburgh*, *Dreadnought*, *Thunderer*, and *Devastation*, poor as cruisers, strong as coast defenders. It could be done gradually, and only as it might appear necessary. A naval establishment formed in the Persian Gulf would in all probability be a mere depôt for coals, defenceless as against a fleet which has the command of the seas. We are apt to make too much of Russian aggression. Our difficulty has always been that Russia is unassailable. A Navy can make no impression on a Power which is self-contained, and essentially military. A naval depôt on the Persian Gulf may be regarded as a security for peace. It must fall into our hands if there is trouble between us. But why anticipate trouble?

Turning from ships in commission to the lists of those built and building, the following figures are taken from the German Naval Annual, *Taschenbuch der Kriegsflootten*, compiled by Lieut. Weyer. They show the battle-fleets of the Great Powers in 1907, that is to say, when all ships now building are completed. It should perhaps be noted that no allowance is made for the rumoured new Russian programme of six battleships.

Ships
built and
building.

Battle-
ships.

	Ships.	Total tonnage
Great Britain	54 .	749,000
France	31 .	345,000
Russia	26 .	303,000
France and Russia	57 .	648,000
United States	21 .	260,000
Germany	19 .	213,000

France, Russia, and Germany aggregate 861,000 tons against 749,000 tons for Great Britain. If, however, we include the new and more powerful battleships about to be laid down in this country, we shall be nearly equal in battleship tonnage to the combined strength of France, Russia, and Germany.

Cruisers.

Passing from battleships to cruisers, *Nauticus*, the organ of the German Navy League, gives the following comparative table:—

CRUISERS OVER 5,000 TONS, LAUNCHED IN 1887
AND SUBSEQUENTLY.

	Total number	Armoured	Aggregate tons displacement
Great Britain	70	29	648,440
France	28	23	243,171
Russia	13	5	100,606
Germany	11	5	81,750

The comparative tables of the *Naval Annual*, which are a closer approximation to the survival of the fittest, give the following:—

CRUISERS, BUILT AND BUILDING.

	First-class	Second-class
Great Britain	38 .	40
France	14 .	15
Russia	3 .	13
Germany	5 .	6

We have an unchallenged superiority in all classes of cruisers, and not least in those of the most powerful

type. We are more than equal to France and Russia combined.

Enough has been said to show that the present position of the permanent force of the British Navy is satisfactory. In ships, in sea officers and men, inspired by the best traditions of the past, and highly trained, we may compare, not to our disadvantage, with the combined strength of France, Russia, and Germany; and such a combination is too improbable to call for serious consideration. It is inconceivable that the foreign policy of the Empire should be so ill-directed as to bring into array against us the united naval forces of the three chief Powers of Europe.

STRENGTH, RECRUITING, AND TRAINING OF PERSONNEL.

Passing to the efficiency of the *personnel*, the Training. important Memorandum of the First Lord of the Admiralty, dealing with the training and position of naval officers, marks a new departure in an ancient and noble service. It is dealt with at length in the *Naval Annual* for this year. The altered character of the modern Navy had long ago called for a corresponding change in the subjects and the methods of professional training. To discuss the ultimate developments in relation to the position of officers would be premature. It is difficult to believe that engine-room duties can be interchanged with those of navigation and command. The promotion of the engineer officers to the highest grade should be appro-

priately found in the dockyards and in Admiralty appointments.

Manned as it is without recourse to conscription, the cost of the British Navy is necessarily heavier than that of the Navies of continental Powers. In round figures it may be taken per head at : France, 70*l.* ; Germany, 60*l.* ; Russia, 50*l.* ; Italy, 50*l.* In the United States the cost per man in time of peace rises to 115*l.* With the addition of 4,600 men proposed for the British Navy in the financial year we have an increase of 632,000*l.* in the votes.

The addition to the British Navy Estimates under the several votes which provide for the manning of the Navy has, in recent years, been greatly in excess of the expenditure elsewhere.

NAVY ESTIMATES, 1903-4.

			Increase
Numbers voted . .	127,100 . .		4,600
	£		£
Vote I.—Wages . .	6,312,800 . .		350,800
„ II.—Victualling . .	2,292,500 . .		269,000
„ III.—Medical . .	259,000 . .		12,500
Total . .	<u>8,864,300</u>		<u>632,300</u>

NAVY ESTIMATES, 1893-4.

Numbers voted	74,100
	£
Wages	3,520,000
Victualling	1,215,700
Medical	125,000
Total	<u>4,860,700</u>

In the last ten years we have added 53,000 to the numbers, and four millions, in round figures, to the annual cost of the permanent force. To this increase

we have to add future charges upon Estimates for retired pay. The amount for non-effective services for 1903-4 is 2,320,700*l*. The recent additions to the permanent force will double the non-effective votes.

Let us turn from the expenditure in connection with the *personnel* for the British Navy to the man- Foreign Navies.
ning votes for foreign Powers.

	France		Germany		Russia	
	1902	1903	1902	1903	1902	1903
	£	£	£	£	£	£
Pay . . .	1,952,982	1,928,405	953,948	1,026,530	603,036	} 1,209,224
Victualling .	831,852	811,591	69,676	73,896	203,398	
Clothing .	151,848	155,014	17,346	17,509	303,758	
Medical .	79,304	77,704	69,984	74,679	126,570	
	3,015,986	2,972,714	1,110,954	1,192,114	1,236,762	1,341,224

For France, Russia, and Germany the increase is trifling when compared with that for the British Navy. The large excess in the charge for the man-
ning of the British Navy is due partly to our system of voluntary service. It is also largely due to our policy of providing for all emergencies mainly by reinforcement of the permanent force. Other Powers depend on their Reserves for mobilisation for war. In comparisons of strength we do not reckon foreign ships to be inefficiently manned.

The officers and men of our Royal Navy are a force of which the nation may justly be proud. It is natural that the naval advisers of the Admiralty, reared from their boyhood in a noble service, should share the reluctance with which Reserves have been Naval Reserves.

accepted by their brother officers of the Army. Neither the Volunteers, nor the Yeomanry, nor even the Militia, were viewed with favour by the military authorities of the older day. There are, however, considerations which statesmen are bound to take into view—considerations which, to do them justice, have been fully present to Lord George Hamilton, Lord Goschen, and to their successors now in office, but which may seem of less importance to those who do not share their responsibilities to Parliament in matters of finance. The reinforcement of the Reserves is urgent, and has been long neglected. The Reserve Vote, as proposed in the Estimates for 1903–4, is 297,000*l.* For the year 1893–4 the corresponding figure was 286,900*l.* The Reserves have been starved. We muster 41,540 men, all told, as against more than 100,000 on the rolls of the French *inscription maritime*, with at least 50,000 efficient. Our numbers are insufficient and the arrangements for training inadequate. The drills of the Naval Reserve should be more under the supervision of officers. Drill sheds and guns have not been up to requirements.

Efficiency
of
Reserves.

With due care in their training a Reserve force can be made efficient. The fleets which won the great battles of the past were not manned by permanent men. The crews were raised by the press-gang. For the most part they were not seamen. They were trained rapidly in the school of experience in war, and brilliant victories were gained. It has been contended that in the modern ship of war the

complications of construction, machinery, and armaments demand higher skill and training in the crews than were necessary in the ruder types of former days. The subject was discussed at length in Lord George Hamilton's Memorandum of 1891. 'Success,' he wrote, 'in future wars will, I believe, rest, not so much with numbers, as with the force which can make the best use of the scientific weapons at their disposal.' He proceeded to enumerate the requirements of the Navy, having regard to the difficulty of supply. Executive officers, warrant officers, engine-room officers required a complete training, and could not be obtained in any emergency. Petty officers, seamen, and stokers required a more limited training. The increase to the force of permanent men should consist mainly of the classes requiring high training. For the other classes we could rely upon the Reserves.

The opinion of the younger officers of the Navy is valuable on this subject. The writer of an essay, to which the second prize of the Royal United Service Institution was recently awarded, may appropriately be quoted:—

Practical
naval
opinion.

'Take,' he says, 'the case of a modern cruiser, the *Cressy*, with a complement of 615 officers and men. This ship has two 9.2-in. guns, twelve 6-in., and seventeen light Q.F. guns. Eighteen men for the 9.2-in., ninety-six for the 6-in., and sixty-three for the light guns, are necessary to form the full crews, or 177 in all. Of this total a considerable proportion of the "higher numbers" of the guns' crews could be

replaced by absolutely untrained men. Their duties do not call for special skill. Captains of guns must be good shots.

‘Great skill and care are required in adjusting torpedoes, so that one fully trained man at least is required at each tube. The purely mechanical work of hoisting the torpedo up and putting it in the tube could be performed efficiently, though slowly, by untrained men under his skilled supervision. In magazines, in shell rooms, and in the passages, to pass the ammunition to the guns, employment for absolutely untrained men can easily be found in abundance. On deck we appear to be in a far better position than in the sailing days. Helmsmen and telegraph men alone are required, apart from the captain and his attendants. No riggers or sail trimmers now to work the ship; their place is taken by engineers and stokers below. For purely fighting purposes a man-of-war should rapidly become efficient, if commissioned with a portion only of her crew trained in the peace methods of the Navy.’

The
United
States
Navy.

The present writer can contribute something on this subject from personal observation. When the fleet assembled last year at Spithead for the Coronation review, he took the opportunity of paying a visit to the American flagship. In reply to some remarks on the fine appearance of the crew, the captain said: ‘You will probably be surprised to learn that out of my ship’s company of 700 men no less than 135 were drawn from the inland states, chiefly from Chicago

and the vicinity. These men have fully compensated for their inexperience at sea by the pains they take to acquire a knowledge of their duties. In a mastless ironclad they are not those of an A.B. The training required is in gunnery and boats.' In addition to the novices the ship carried ninety-five apprentices. The complement was thoroughly efficient, although consisting, as to a full third of the total number, of untrained men. In France, and to a larger extent in Germany and Russia, the crews, as we have pointed out, include a considerable percentage of landsmen.

The Admiralty have recognised that their policy in relation to manning needs revision. Early in last year a strong Departmental Committee was appointed, with Sir Edward Grey as chairman. That Committee has lately presented its report. In dealing with their important recommendations some observations may be repeated, on the lines which have been consistently followed in previous numbers of the *Naval Annual*.

Com-
mittee on
Reserves.

No difficulty need be apprehended in raising our Naval Reserves to any necessary standard of strength. Short service in the Navy will supply the best men for a Reserve. The Royal Fleet Reserve, a most valuable force, has recently been organised. The Reserves Committee recommend the removal of the limit of 15,000 in the numbers.

The Royal
Fleet Re-
serve.

For gunnery and deck duties the Reserve may be raised to any number which may be required. It is

Stokers.

more difficult to man the engine-rooms and stokeholds. The Reserves Committee recommend that ships should embark as supernumerary to the complement as many more non-continuous service stokers as could be accommodated. The non-continuous men should engage for five years' service in the Fleet, followed by service in the Royal Fleet Reserve, to make up twelve years from the date of entry. In addition to the new sources of supply created by short service in the Navy, the Reserves Committee suggest the entry of stokers from gasworks, electric-light factories, and other works. If the terms be made attractive large numbers could be obtained.

We have a source of supply, from which no attempt has yet been made to draw recruits, in the many thousands of firemen of the tropical races employed in British ships. Our Indian troops are reliable for the military service. From the same races we should raise a Reserve for the Navy, and more particularly for the engine-room complements. Mr. Anderson, the well-known shipowner, gave evidence in this sense before the Reserves Committee. A large number of stokers could be obtained in Malta, who, being all collected in a small area, would be readily available within a few days of England.

Recruit-
ing for
Reserves.

Behind the highly-trained men supplied to the Reserve by an extension of short service in the Navy, we have many sources from which recruits may be drawn. The Reserves Committee make numerous recommendations with the view :—

- (a) To encourage recruiting.
- (b) To attract large classes, such as yachtsmen and others, who have hitherto held aloof.
- (c) To increase drill accommodation and to give instruction with modern ordnance.

Having taken an active part in raising the Royal Naval Artillery Volunteer force, and having cruised with the volunteers afloat, it is satisfactory to know that the revival of the force is favourably entertained by the present Board of Admiralty and recommended by the Reserves Committee. The men formerly enrolled were full of loyal spirit. They were too hastily disbanded. The Reserves Committee quite properly insist that the volunteers should engage to serve anywhere and do any duty for which they are found competent. They should be under the Naval Discipline Act. The Committee consider that sea-training should, as far as possible, be given in sea-going ships of the Navy, and that it is desirable to encourage the movement to establish Royal Marine Volunteers, trained and organised on a system assimilated to that of the Royal Marine Force.

Royal
Naval
Artillery
Volun-
teers.

The subject of Colonial Naval Reserves is dealt with at some length by the Committee. Experience in South Africa has shown how strong is the desire of the colonials to assist in the defence of the Empire, and how valuable is the aid which they can give. To make a Colonial Naval Reserve force efficient, training may be given in batteries on shore and in vessels

Colonial
Naval
Reserves.

turned over from the Imperial service to the Colonial Governments, to be used as training-ships. The Committee suggest that facilities should be afforded for a more thorough training in His Majesty's ships on foreign stations. This is being done in Newfoundland. Thirty years have elapsed since, at the close of a cruise in Canadian waters, the writer took up the question of a Colonial Naval Reserve. During his residence in Australia, in an official capacity, the subject was frequently under discussion. As the result of an inquiry by the Naval Commandants, it was shown that the seafaring men were more numerous than might have been expected. From Newfoundland and Nova Scotia an important reinforcement to our Reserve of seamen may be obtained. The initiative in the enrolment of Colonial Naval Reserves was taken by Lord Goschen. Further action has been taken by Lord Selborne. To-day we have the complete and practical recommendations of the Reserves Committee.

Naval
Reserve
officers.

The recommendations of the Reserves Committee with reference to the officers of the Naval Reserve include an increase in numbers, the establishment of the rank of commander for senior men, and the weeding out of those who are considered unsuitable for the naval service. Every appointment to the commissioned ranks of the Naval Reserve should be probationary, until the officers have served twelve months in the Navy, and have been favourably reported on by the captains under whom they

have served as fit to hold a commission in the Reserve.

No steps have been taken to insure that the cadets, whose names fill pages of the Navy List, are being educated fittingly as officers of the Royal Navy. On leaving the harbour training-ships, the *Conway* and the *Worcester*, it is difficult to continue the course of education so well begun in the early stages. The Admiralty should grant premiums to shipowners for the sea-training and education of the cadets of the Royal Naval Reserve. The plan of training first organised by the present writer, and carried out with eminently successful results in the *Hesperus* and *Harbinger*, is now being worked by Messrs. Devitt & Moore in the *Illawarra* and *Macquarie*, sailing vessels of 1,900 tons register, in the Australian trade, each carrying forty midshipmen. Some details have recently been published by Lieut. Gordon, R.N., the instructor serving in one of these vessels. The newly-joined midshipmen are taught all details of seamanship. The education is chiefly in mathematical subjects. With assistance from the State it might, with advantage, be extended. Such aid should be given only for those cadets who have been entered for the Royal Naval Reserve.

The Estimates for 1903-4 make no provision for Marines. increasing the strength of the Marines. In a mastless Navy Marines may gradually take the place of a certain number of bluejackets. As gunners, the Marines, and especially the Marine Artillery, rival the bluejackets

in efficiency. The *Ocean* stands at present the best gunnery battleship in the world. It was a Marine Artilleryman who lowered Petty Officer Grounds's score of eight hits for eight rounds in a minute with the 6-in. gun, by getting in nine hits for nine rounds in the same time, and the next best shot in the *Ocean* was another Marine Artilleryman.

Per-
manent
garrisons
at naval
ports.

Our resources for manning the Navy might be materially increased by organising a portion of the Army as an amphibious force. Being accustomed to discipline, soldiers are certainly more suitable for embarkation than the untrained civil population. The necessary administrative arrangements should be carefully considered. Regiments might be permanently quartered at the naval ports. Exercised in boats and drilled with the Marines as naval gunners, they would be better prepared to go afloat than the regiments which did such fine service with the Fleet in the days of Lord Nelson. A Marine Reserve of at least 15,000 men could be obtained by maintaining permanent garrisons at the naval stations of Chatham, Portsmouth, Plymouth, Pembroke, Queenstown, Malta, Gibraltar, and Halifax.

General
con-
clusions.

Let it not be deemed that in these observations undue importance has been given to the subject of Naval Reserves. If the present policy is maintained, our permanent force will grow to such numbers as may involve the imposition of intolerable burdens. We have passed the limits of taxation which can be borne in time of peace. We are crippling the recu-

perative powers of the country, and thus weakening the ability to bear any sudden pressure upon our resources. If we appropriate in undue proportions to manning, progress in construction must be delayed. That is not a result which the naval advisers of the country would contemplate with satisfaction.

It is not possible accurately to estimate the numbers which might be required to meet the stress of a long and hard-fought naval war. A permanent force of 100,000 men should suffice. It should include officers in ample numbers—and fully provide for all ratings requiring special training.

‘ This thing’s to do
Sith I have cause, and will, and means
To do’t.’

With a naval force of 100,000 permanent men, and 100,000 in Reserve, the Navy would be stronger, the expenditure less, than at present.

REPAIRS AND BOILERS.

The management of industrial establishments Repairs. under Government must always be conducted at some disadvantage. The supreme control is in the hands of administrators responsible to Parliament, selected not for their technical knowledge, but for their political influence and ability. Under Treasury regulations rewards are not offered for special exertions. A serious cause of wastage of money will be removed by the decision recently taken by the Admiralty that

the vessels put out to contract shall be delivered to the dockyards 'complete in all respects.' The vast addition to the force in commission has brought increased demands upon the dockyards for repairs and refits, and there are limits to the power of effective supervision by the professional staff. If too much is attempted the result must be congestion and delay. An effective remedy has been applied by putting repairs out to contract, under a schedule of prices. It is one of many reforms due to the administration of Admiral May. Never have the important duties of the Controller been more ably discharged.

Water-
tube
boilers.

The introduction of Belleville boilers has been the cause of wasteful expenditure. Water-tube boilers were recommended to the Admiralty by their professional advisers on the ground that weight would be saved, repairs more easily effected, and steam raised more quickly than in cylindrical boilers. Boilers of the water-tube type had been adopted in the French Navy. The advantages of the new system were conspicuous on first trial from the point of view of tactical efficiency. In a short time orders had been given by the Admiralty for Belleville boilers of more than a million h.p. The new type was accepted without carrying the preliminary trials far enough, and before the officers and stokers of the mechanical branch had been sufficiently trained. When the boilers came into use, they were successfully worked in many ships; they were partial failures in other ships; and some broke down altogether.

It was a wise decision on the part of the Admiralty to secure for the Navy the advantage of the best scientific and practical advice obtainable. A competent Committee was appointed. As the result of their inquiries and experiments, it has been decided to continue in His Majesty's ships four-fifths water-tube and one-fifth cylindrical boilers. Reviewing past experience, Lord Selborne, in his Memorandum on the Estimates, writes as follows: 'I have never attempted to minimise the difficulties which have been caused to the Fleet by the adoption of Belleville boilers. These difficulties were due partly to the faulty manufacture of the first series of such boilers, partly to the great increase of pressure, and partly to the initial want of training of the *personnel* in their management; but they were mainly *ejusdem generis* with those which the Navy had for years to contend with on the first adoption of the various kinds of boilers which preceded them.' The frequent failures in the machinery and boilers of His Majesty's ships are probably due to the pressure put by the naval architect on the engine-builder to cut down weights. Weight saved in machinery means increased thickness of armour, a larger area protected, and more powerful armaments.

Advice of
Civil
experts.

It is interesting to take note of the experiences in foreign countries. In the German Navy it has been decided that half the boilers fitted in new ships shall be of the cylindrical pattern, for the ordinary con-

Boilers in
foreign
Navies.

ditions of service. Water-tube boilers are to be used in action, or when a sudden increase of speed is necessary. In the United States the chief engineer of the Navy has strongly recommended water-tube boilers; the battle of Santiago had shown their necessity. The Babcock and Wilcox is the type of boiler recommended. France, as already said, was before us in the adoption of water-tube boilers, yet the trials of new ships are still marked by many failures.

The Committee on Boilers should become a permanent institution. In these days of extreme speed and vast dimensions the designs for propelling machinery are complicated, the cost is great, and the efficiency of the Navy depends upon the attainment of the highest possible perfection. It seems hardly prudent to throw the whole responsibility on the Engineer-in-Chief.

NAVAL WORKS.

The appropriations to naval works, though not provided directly from the Navy Estimates, are a charge on the taxpayer incurred for the reinforcement of the Navy. The expenditure on naval works should be considered in connection with the Estimates. An examination of the Navy Estimates of the chief maritime Powers of Europe will show that our expenditure on naval works has been carried to excess.

NAVAL EXPENDITURE, 1902-3.

	Total	Ship- building	Naval Works
	£	£	
Great Britain, Estimates .	31,255,000	9,473,000	Vote 10 and Navy Works Acts . . } £ 3,349,000
Navy Works Acts	2,749,015	—	
	34,004,015		
France . .	12,271,000	4,407,000	598,423
Germany . .	10,234,000	3,679,000	366,212
Russia . .	10,600,000	2,600,000	961,118
	33,105,000	10,686,000	1,925,753

NOTE.—The expenditure under Navy Works Acts is taken at the amount given in the Parliamentary return for the year ending March 31, 1902. In Russia special expenditure on ship-building has been proposed. The naval works of foreign Powers include items which in Great Britain would be included in Military Works Bills.

While keeping pace, but not more than keeping pace, with the three Powers in shipbuilding, our expenditure on naval works in the period 1895 to 1901, as authorised under the Naval Works Bills, increased from 8,806,000*l.* to 27,502,000*l.* In addition large sums were voted under Military Works Bills for the defence of naval stations at Gibraltar, Halifax, Malta, Wei-hai-Wei, Bermuda, Jamaica, and other places. When public opinion demands reinforcements for the Navy there is a tendency favourably to consider proposals for extending dockyards and constructing breakwaters. The structures reared by the civil engineer are commended to approval as being, in the nature of things, more enduring than the creations of the naval architect. They do not always add materially to the sea-power of the Navy.

COLONIAL CONTRIBUTIONS.

Federa-
tion

In estimating our financial resources it is premature to look to the self-governing Colonies. To rely on contributions, sufficient in amount to give any real help, is to lean on a broken reed. A scheme of representation, the necessary corollary of contributions, has yet to be devised. The recent Conference with the Premiers of the self-governing Colonies met under favourable auspices. In South Africa our arms had been crowned with victory. Colonial contingents had stood shoulder to shoulder with Imperial forces. The Coronation had brought together representatives of every part of the Empire. It was an impressive object lesson. It taught that unity is strength. The Minister who presided has commanding influence in the Colonies. He is in full sympathy with the Imperial ideal. Mr. Chamberlain wisely recognised that it was premature to press schemes of federation for acceptance by the Conference. No decisions were taken, except in relation to defence. The subject was raised in a resolution, moved by Mr. Seddon, and in a Memorandum prepared by Sir John Forrest, Minister of Defence under the Australian Commonwealth, in consultation with Sir Lewis Beaumont, Commander-in-Chief on the Australian Station. Sir John Forrest was opposed to the establishment of an Australian Navy, both on grounds of expense and because it was not possible to attain to a high standard of efficiency in a small service. He

was prepared to make a larger contribution to the cost of the Imperial squadron on the Australian station. The views put forward by Sir John Forrest have not been favourably criticised by the Australian Press. Canada was also dissentient, on the ground that the proposals would entail an important departure from the principle of Colonial self-government.

Ambitious schemes for an Australian Navy are in the air. They can only be realised by an expenditure quite beyond the resources which at present, or for a long time to come, can be available. If in some later day a local Navy should be created, the naval forces of the Commonwealth would give the same ready and powerful help at sea as we have lately received from the contingents in South Africa. Let us not be hasty to criticise Australian statesmen when they insist that their coasts shall never be left wholly unprotected by the Navy. For ourselves it is held as an axiom that we must never lose the command of the Channel. In the United States, when at war with Spain, a portion of the Fleet was retained for coast defence, Captain Mahan being a member of the Council of Defence by which the movements were directed.

Local
Navies.

While their subsidies are inconsiderable, the Colonies are contributors on a vast scale to the wealth of the Mother-country. Some telling statistics have been put together by Mr. Parkin. He estimates the borrowings of Australia at 400,000,000*l.*, all of which was raised in London, and not on the easiest terms.

Indirect
aid.

Canada's public borrowings exceed 50,000,000*l.* An equal sum may be allowed for private loans. British capital to the amount of nearly 400 millions has found a profitable field in India. The aggregate of money loaned from Britain, and borrowed by other parts of the Empire, reaches enormous figures—if has been computed as exceeding 1,000 millions sterling. For investors and borrowers the benefit is mutual. In proportion to population the Colonies have been the best customers for our manufactures. We have received in payment raw materials and supplies of food in increasing volume and at falling prices. Our share in this exchange is not disadvantageous. Meanwhile, let us gratefully accept from the Colonies such aid as they are able to give, and in the form in which it is most readily given. A generation ago the self-governing Colonies relieved the Mother-country of the heavy charge formerly incurred in providing for the defence of important naval positions at the sole cost of the Imperial Exchequer. Our principal naval base at Sydney, and the ports of Fremantle, Adelaide, and King George's Sound have been strongly fortified. Effective steps, as we have seen, are being taken in Newfoundland, in Australia, and New Zealand to raise a strong Reserve force for the manning of the Navy.

Imperial
and
National
defence.

If the Conference has not done much to help us, we may in fairness keep in view that the naval expenditure especially incurred for the protection of the Colonies is trifling in amount. When Navy Estimates

are in preparation we do not look to the Colonies. We consider the expenditure of other Powers, which we must be prepared to meet. Our programme of ship-building is based on such comparisons. The subject of Colonial contributions for the Navy was discussed by Earl Grey in his volumes on the Colonial policy of the administration of Lord John Russell. His words may be quoted: 'The naval expenditure which is frequently charged against the Colonies cannot in my opinion be so with any justice, since, if we had no Colonies, I believe the demands upon our naval force would be rather increased than diminished, from the necessity of protecting our commerce.' The views of Earl Grey were shared by Sir Cornwall Lewis. In his essay on the 'Government of Dependencies' he wrote as follows: 'It is not easy to estimate how far Great Britain could afford to diminish the strength of her Navy, even if she had no foreign or Colonial possessions. To make the British Islands secure against foreign invasion; to protect British trade in all parts of the world; in a word, to keep Great Britain going as a nation, it would always be necessary to have a powerful Navy; and it is, therefore, hardly fair to state as roundly as is usually stated, that the cost of the Imperial Navy is due to the fact that the Colonies of Great Britain are so many and so widely spread.'

Nor let us lightly value the moral support which the Colonies have it in their power to give to their Mother-country. At the close of a visit to Australia,

Moral
support
of the
Colonies.

in her well-spent twentieth year, the Marchioness of Stafford, as she then was, when rounding Cape Lewin, wrote as follows : ‘ Great Britain is, indeed, fortunate in having such brothers and sisters as she had found in Australia, loyal and true, ready to stand by her in storm and sunshine, and to see her great name sustained for centuries to come.’ In the war in South Africa we were grateful to the Colonies for the gallant services of their contingents. We valued even more the support which the public opinion of the Colonies had given to British policy. The contingents had drawn no conscript sword. Colonial statesmen had given their testimony in the name of free peoples. The Colonies have helped the Mother-country, and will yet help her, but not by subsidies. They will come to us as companions in arms.

To conclude. In measuring naval requirements we are bound to look to the preparations of foreign Powers.

- I. We are in excess of foreign Powers in the votes for men. We barely keep pace in shipbuilding.
- II. Our permanent force exceeds, our Reserves for manning the Navy are below, the strength of foreign Powers.
- III. Our squadrons on distant foreign stations admit of reduction. If we reduce the ships in commission we can reduce the vote for men. For possible emergencies we should strengthen the Reserves.

In all warlike preparations waste is unavoidable. Everywhere much is done which might well have been omitted. When the emergency comes much is certain to be wanted which has not been provided. These obvious reflections have been brought home in scenes through which I have lately passed. The business associations of my family with Italy extend over three generations. We have shared the burdens of Italian taxation. Steaming a few days ago through the narrow and tortuous channels leading to the naval station of Maddalena, an Italian taxpayer might question the need for the expenditure incurred in the defence of a position so little likely to be attacked, and offering practically no advantage over Spezzia for offensive operations never likely to be undertaken.

Four hours after leaving Maddalena we anchored in the Bay of Ajaccio. Its shores bristle with guns. For the *défense mobile* a torpedo station has been formed with seventeen torpedo boats in commission, manned by officers and men of the finest stamp and quality. Here again the stranger friendly to France may ask himself the question, Where is the enemy who threatens and whom it is deemed necessary to resist? In the words which the King lately addressed to the British Chamber of Commerce in Paris, he truly spoke in the name of his people. There is no other conceivable enemy.

And we, too, are creating a great Fleet—the

stronger, the less likely to be used in war. A Naval Reserve, such as it has been the chief object in the present paper to recommend, has a double function. It can be usefully employed in peace.

BRASSEY.

AJACCIO : *May* 7, 1903.

APPENDIX

PERMANENT FORCE AND ROYAL NAVAL RESERVE.

Year	Permanent Force. Numbers voted.	Royal Naval Reserve ¹ borne on Dec. 31
1889	65,400	19,332
1890	68,800	19,881
1891	71,000	20,620
1892	74,100	21,967
1893	76,700	22,823
1894	83,400	23,273
1895	88,850	23,723
1896	93,750	24,160
1897	100,050	25,354
1898	106,390	26,141
1899	110,640	25,712
1900	114,880	24,863
1901	118,625	24,461
1902	122,500	24,648
1903	127,100	—

¹ Exclusive of officers.

TABLES FROM THE *TASCHENBUCH DER KRIEGSFLOTTEN*.

(It should be noted that in Germany and England the life of a battleship is officially reckoned as twenty-five years and a cruiser twenty years. The tonnage in Germany is reckoned in metric tons.)

COMPLETED BATTLESHIPS ON JANUARY 1, 1903

(Without regard to age).

England		57	709,400 tons.	
Germany		17	166,100	"
France		35	337,100	"
Russia		21	230,700	"
Total (Continental Powers)		73	733,900	"

} 56 ships,
567,800 tons.

COMPLETED BATTLESHIPS ON JANUARY 1, 1905

(Less than 25 years old).

England	.	.	.	.	48	627,800 tons.		
Germany	.	.	.	.	14	14,400	"	
France	.	.	.	.	31	306,900	"	} 51 ships, 528,000 tons.
Russia	.	.	.	.	20	221,100	"	
Total (Continental Powers)					65	672,000	"	

BATTLESHIPS AT THE COMMENCEMENT OF 1907

(Less than 25 years old).

England	.	.	.	.	54	749,300 tons.		
Germany	.	.	.	.	19	213,000	"	
France	.	.	.	.	31	344,900	"	} 57 ships, 647,800 tons.
Russia	.	.	.	.	26	302,900	"	
Total (Continental Powers)					76	860,800	"	

COMPLETED LARGE CRUISERS ON JANUARY 1, 1903

(Without regard to age).

England	.	.	.	.	54	460,000 tons.		
Germany	.	.	.	.	11	79,500	"	
France	.	.	.	.	23	170,300	"	} 38 ships, 286,600 tons.
Russia	.	.	.	.	15	116,300	"	
Total (Continental Powers)					49	366,100	"	

COMPLETED LARGE CRUISERS ON JANUARY 1, 1903

(Less than 20 years old).

England	.	.	.	.	54	460,000 tons.		
Germany	.	.	.	.	8	54,400	"	
France	.	.	.	.	23	170,330	"	} 36 ships, 275,000 tons.
Russia	.	.	.	.	13	104,700	"	
Total (Continental Powers)					44	329,430	"	

COMPLETED LARGE CRUISERS COMMENCEMENT OF 1907

(Less than 20 years old).

England	.	.	.	.	76	681,800 tons.		
Germany	.	.	.	.	11	82,100	"	
France	.	.	.	.	30	255,500	"	} 44 ships, 365,600 tons.
Russia	.	.	.	.	14	110,100	"	
Total (Continental Powers)					55	447,700	"	

NAVY BUDGETS OF THE EIGHT LEADING SEA POWERS, 1898 TILL 1902

According to Official sources. In Million Pounds sterling and two decimals (converted from the German Statistics at 20 Marks = £1).

	1902		1901		1900		1899		1898		TOTAL 1898-1902		AVERAGE PER YEAR	
	Total	Ship- building (includ- ing Arma- ment)	Total	Ship- building (includ- ing Arma- ment)	Total	Ship- building (includ- ing Arma- ment)	Total	Ship- building (includ- ing Arma- ment)	Total	Ship- building (includ- ing Arma- ment)	Total	Ship- building (includ- ing Arma- ment)	Total	Ship- building (includ- ing Arma- ment)
ENGLAND	83.02	14.61	82.94 ²	14.98 ²	81.69 ³	11.49 ⁵	28.13	11.68	25.67 ²	10.41 ²	151.42	66.33	30.28	13.26
FRANCE	12.64 ⁵	6.11	13.27	5.9	12.67	5.85	12.79	5.61	11.62	5.53	62.49	29.06	12.50	5.81
UNITED STATES	16.31	7.24	17.96 ²	8.14 ²	14.59 ²	4.91 ²	11.20 ⁴	3.14 ⁴	11.78 ⁶	4.46 ⁵	71.84	27.89	14.37	5.58
RUSSIA ¹	10.81	4.06	10.68	4.13	9.53	4.07	9.24	3.49	7.48	3.01	47.75	18.75	9.55	3.75
GERMANY	10.25	5.15	9.83	5.03	7.63	3.47	6.69	2.83	6.15	2.56	40.51	19.05	8.10	3.81
JAPAN	3.12	0.86	4.08	1.81	4.50	2.23	5.63	3.40	8.67	5.13	25.98	13.44	5.19	2.69
ITALY	4.80	1.94	4.72	1.92	4.70	1.92	4.85	1.55 ²	4.47	1.29	23.91	8.67	4.73	1.73
AUSTRIA	1.98	0.89	1.85	0.81	1.81 ²	0.64 ²	1.50	0.56	1.25	0.46	8.45	3.38	1.69	0.67

¹ Besides these amounts special credits have every year been allowed for the Navy (especially for shipbuilding), the amount of which is not known.

² Including a supplementary credit.

³ Including two supplementary credits.

⁴ Exceptionally high total owing to the war with Spain.

⁵ Including three supplementary credits.

⁶ The Budget was reduced by 1.1 million pounds sterling in consequence of the colonial troops being no longer charged to Navy votes.

PERSONNEL OF THE GREAT SEA POWERS IN 1902
(Reprinted from *Nauticus*, 1902).

	Execu- tives	En- gineers	Med- ical Offi- cers	Accoun- tant Branch	Chap- lains	Na- val Cadets	Technical Officers (Gunners, Torpedo, etc.)	Chief Petty Officers, Petty Offi- cers, and Men of all branches, including boys	TOTAL	Other bodies belonging to the Naval Establishment.				TOTAL
										Marines	Seamen Ar- tillery	Coast Guard	Pen- sioners in active service	
ENGLAND . . .	2,366 ¹	1,019 ¹	527 ¹	448 (in- cluding 23 Sec- retaries)	175 (in- cluding 44 Naval Instruc- tors)	934	—	92,127 (in round figures)	97,596	19,807 ²	—	4,200	1,288	122,891
FRANCE . . .	1,559	327	470	343	27	263 ³	—	50,500 about	about 53,500	—	—	—	—	—
RUSSIA . . .	1,381	346	354	— ⁴	?	750	175	59,000	about 62,000	—	—	—	—	—
UNITED STATES OF NORTH AMERICA }	1,303 ⁷	221		180	24	632	—	28,508	30,868	7,013	—	—	—	37,881
GERMANY . . .	1,054	183	175	134	20	601	111	27,713 about	29,991 about	1,275	2,296	—	—	33,562
ITALY . . .	925	262 ⁵	219	289	—	?	—	25,000	26,700	—	—	—	—	—
JAPAN ⁶ . . .				2,760			—	28,140	30,900	—	—	—	—	—
AUSTRIA . . .	563	88	62	125	9	180	—	8,699	9,726	—	—	—	—	—

¹ The officers, &c., on half pay are included.² Of these as per list 11,805 for service in the Navy.³ The cadets, the number of which is not known, are not included.⁴ Besides 112 engineers (constructive engineers).⁵ According to the list made out on July 1, 1902, the number of naval officers proper was: 874 officers, besides 125 cadets. (The number of men of all branches appears to include marines, and in that case the marines have been counted twice over in the last column.)⁶ The figures for Japan are uncertain.⁷ The service of the accountant branch is performed by the executive branch.

DISTRIBUTION OF SHIPS.

Note by Lieutenant Carlyon Bellairs, R.N.

Adopting the Admiralty classification given in the Parliamentary Return of Fleets of the Powers, and the very latest news as to the distribution of ships in commission and in Reserve, the following comparisons are obtained :—

On the Cape station Great Britain has the obsolete battleship *Monarch*, one first-class cruiser, two second-class cruisers, three third-class cruisers, two sloops, five gunboats, two stern-wheel vessels, and two torpedo boats. The Cape Station.

The French have four paddle vessels, and other nations are unrepresented. We are spending what is an estimate of £3,500,000 on Simon's Bay with the resources of Cape Town close by, and when it is an established fact that there is not a foreign dockyard within thousands of miles.

On the East Indies station, at the time of writing, we have the second-class cruisers *Highflyer* and *Fox*, three third-class cruisers, three gunboats, one paddle vessel, two turret ships, and seven torpedo boats. The Indian Government maintains one trooper and five inland steamers. The East Indies.

France has one third-class cruiser, the *Infernet*; one special vessel, the *Capricorne*, of 476 tons. As in the case of the Cape, the other nations do not maintain any ships.

On the North American station we maintain one coast-defence ship, the *Hotspur*; one first-class cruiser, four second-class cruisers, one third-class cruiser, two sloops, two destroyers, two gunboats, one special service vessel, and six torpedo boats. Owing to recent difficulties in Venezuela, foreign nations are better represented than under normal conditions. France has one first-class cruiser, one third-class cruiser, and a paddle vessel. The North American and West Indies Station.

Germany has one second-class cruiser, two third class cruisers, one sloop, and a gunboat.

S.E.
Coast of
America

On the S.E. coast the European continental Powers are unrepresented, but Great Britain maintains a second-class cruiser and two sloops.

China.

Great Britain maintains four battleships, four first-class cruisers, four second-class cruisers, one third-class cruiser, seven sloops, five gunboats, one despatch vessel, eight special river gunboats, two surveying vessels, seven destroyers, and four torpedo boats. There are forty-seven vessels in all. Russia has four battleships, five first-class cruisers, one second-class cruiser, four sloops, two gunboats, two torpedo vessels, two mining transports, six special small vessels, eighteen destroyers, and seventeen torpedo boats. The greater part of the smaller vessels are kept in reserve, whereas we maintain all except three gunboats, four destroyers, and four torpedo boats, in commission. The Russian battleships *Pobieda* and *Retvizan* are on their way to China. France has one third-class battleship (to be relieved by the first-class cruiser *Montcalm*), two first-class cruisers, two second-class cruisers, two gunboats, one sloop, seven torpedo boats, and twenty small vessels including river gunboats.

The
Mediterranean.

Great Britain maintains on the Mediterranean station fourteen battleships, two first-class cruisers, six second-class cruisers, seven third-class cruisers, one torpedo depot vessel, five torpedo gunboats, twenty-eight destroyers, and twenty-two torpedo boats. France has six battleships in commission and three in reserve, four first-class cruisers, two second-class cruisers, five third-class cruisers, five torpedo vessels, one coast defence vessel, one gunboat, five destroyers, and forty-nine torpedo boats (nine at Algiers, eleven at Oran, fourteen at Tunis, and fifteen at Corsica). Russia has one battleship, three first-class cruisers, one second-class cruiser, two sloops, one torpedo vessel, seven

destroyers, and two torpedo boats. Germany has a small vessel of 900 tons and twelve knots speed.

Great Britain maintains one first-class cruiser, two second-class cruisers, one sloop, and two destroyers. The United States has one first-class battleship, one first-class cruiser, two second-class cruisers, four third-class cruisers, four sloops, one gunboat, four destroyers, two special vessels, and three torpedo boats.

The agreement arrived at with the Colonial Government provides that 'the naval force on the Australian Station shall consist of not less than the undermentioned sea-going ships of war, all of which shall be from time to time throughout the terms of this agreement of modern type, except those used as drill-ships:—One armoured cruiser, first-class; two second-class cruisers; four third-class cruisers; four sloops; and of a Royal Naval Reserve consisting of twenty-five officers and 700 seamen and stokers.' Great Britain has now one first-class cruiser, eight third-class cruisers, one sloop, four gunboats, and two surveying vessels.

The sphere of operations of the Squadron has been extended to the China and East Indies stations by the recent agreement with Australia and New Zealand.

TABLE SHOWING COST OF *MATERIEL* OF THE NAVY.

Year	Total for New Construction	Repairs and Maintenance	Dockyard and Incidental Charges	Cost of Royal Reserve of Merchant Cruisers	Value of Coal for all Purposes	Total for Labour and Materials	Total expended under all Navy Votes	Expenditure on Naval Works
1896-97	£ 7,327,000	£ 1,305,000	£ 521,000	£ 53,000	£ 571,000	£ 10,313,000	£ 22,272,000	£ 1,012,000
1897-98	5,051,000	1,567,000	549,000	49,000	702,000	8,120,000	20,849,000	607,000
1898-99	6,733,000	1,676,000	538,000	47,000	833,000	10,522,000	23,881,000	2,707,000
1899-00	7,518,000	1,940,000	580,000	49,000	1,016,000	12,075,000	25,731,000	
1900-01	8,957,000	2,240,000	637,000	65,000	1,478,000	14,498,000	29,999,000	2,194,000 ¹
1901-02	8,865,000	2,478,000	662,000	7,000	1,701,000	14,819,000	30,981,000	3,246,000 ²

¹ Estimated.² Appropriation for 1901-2 and 1902-3, £6,492,000. Fifty per cent. apportioned to 1901-2.

